

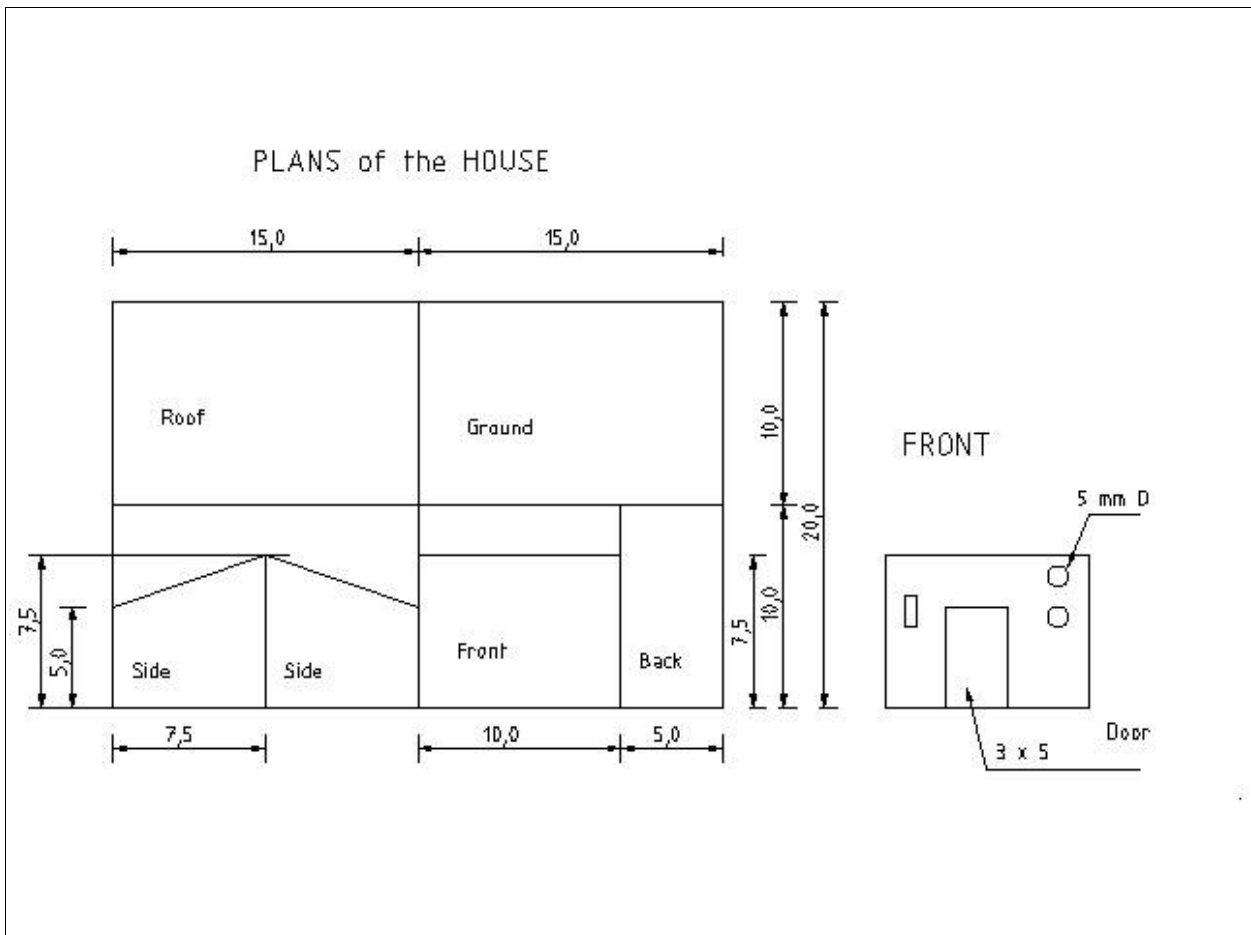
## BURGLAR'S ALARM SYSTEM

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### INTRO

Here you will find a fair project for high-school students. The project is about a Burglar's Alarm that will emit a sound when a burglar tries to open the door of a house.

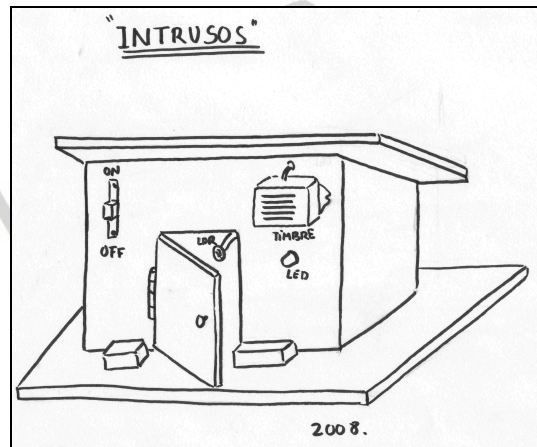
The whole project has two parts: first, we will make a **working model** of a **dis-mountable house**, made of plywood. In order to make the different pieces of the house we will use the plan you can see below. Secondly, we will work on the **electronic board** following a circuit.



**1<sup>st</sup> PART: HOUSE, WORKING MODEL.**

On a 20x30 cm piece of plywood, draw the 6 pieces of the house (a base, a front-wall, a rear-wall, a roof and two side-walls) following the above plan. Then, cut and file them.

Also, you have to cut two strips of wood (1x1cm) with 7.5 cm length, then another two strips with 2.5 cm length and finally one more strip with 9 cm length. The five strips all together will be useful to mount and dismount the front-wall and the roof of the house. The sketch above shows what the mounted house looks like.

**2nd PART. THE ELECTRONIC BOARD.**

The alarm has a buzzer and a LED controlled by an electronic board. The whole automatism consist of three functional blocks as is shown on the circuit below.

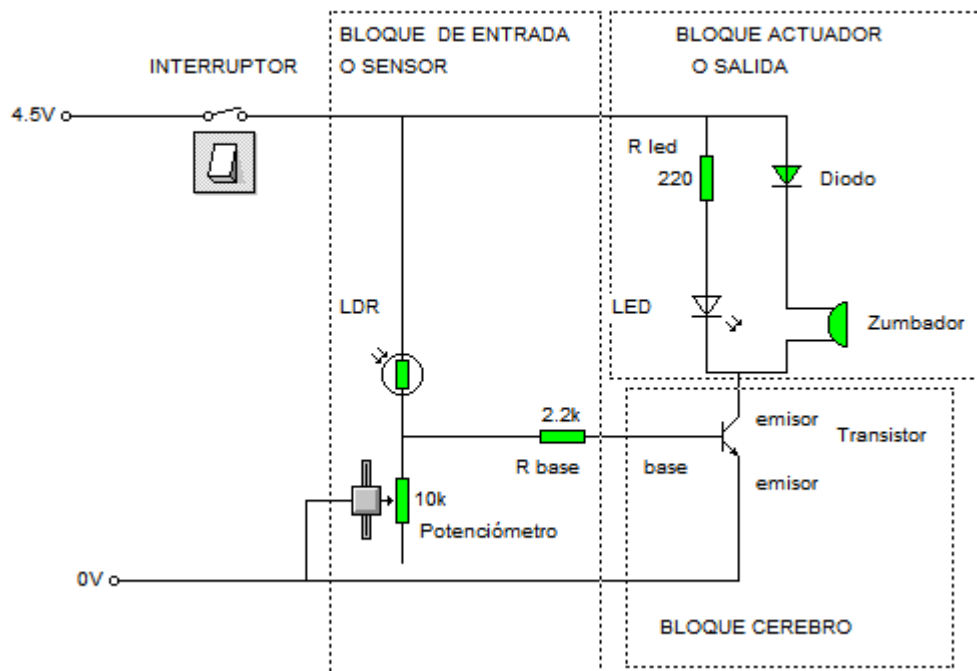
**Sensor or Input Block:** The sensor block is built as a voltage divisor, and consists of a resistor, which ohmic resistance varies with the intensity of light (LDR), connected in series with a potentiometer. The potentiometer should be adjusted to its midpoint .

The sensor is placed inside the house, behind the door. The functioning of the sensor block is easy, when the door is opened the light from outside reaches the LDR and the voltage applied to the base of the transistor increases ( $>0,6V$ ). When the door is closed the LDR keeps in dark and the voltage at the base of the transistor drops dramatically ( $<0,6V$ ).

**Control Block:** The transistor works as an electronic switch that turns the current ON or OFF on the circuit that controls depending on the voltage applied to its base (the triggering value is about  $0,6V$ ). Thus, when the incident light on the LDR is high enough, the transistor turns into active state commanding the buzzer to sound and the LED to light. When it is dark, the transistor turns back to an inactive state, and either the buzzer or the LED are turned OFF.

**Output Block:** It consists of the buzzer and the diode LED that warn us when a burglar has opened the door and tries to get into the house.

## INTRUSOS: BLOQUES FUNCIONALES DEL AUTOMATISMO



## List of components

- Fast-on connector for 4,5 V battery
- General switch
- Light Sensor LDR
- \*Potentiometer 10k $\Omega$
- R<sub>base</sub> of the transistor R= 2k2
- \*Transistor npn BD135
- \*Diode LED
- Resistor to protect the LED, R<sub>Led</sub>=220 $\Omega$
- \*Diode 1n4004 or similar (D1)
- \*Buzzer (3V dc)

**\*Components with polarity. It means that their pins are different from one another.  
!MIND IT!**

## Sketch

